WEST Search History

Hide Items | Restore | Clear | Cancel

DATE: Friday, March 05, 2004

Hide?	Set Name	Query	Hit Count
		DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ	
☐	L31	20020173715 A1	2
		DB=PGPB; PLUR=YES; OP=ADJ	
☐	L30	L29 and (riederer.in.)	3
☐	L29	kruger.in.	130
☐	L28	us20020173715	0
		DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ	
☐	L27	200201737715	0
☐	L26	L25 and ((continuous$3 or constant$4 or "without stopping" or convey$5) with (move or moving or moved or motion or movement))	55
☐	L25	L23 and ((move or moving or moved or motion or movement) with (bolus or contrast or table or gantry or stretcher or bed or support or platform or object or subject or patient))	82
☐	L24	L23 and ((move or moving or moved or motion or movement) with (bolus or contrast or table or gantry or stretcher or bed or support or platform))	55
☐	L23	L22 and (bolus or contrast or table or gantry or stretcher or bed or support or platform)	129
☐	L22	L21 and (move or moving or moved or motion or movement)	132
☐	L21	L15 and ((field with view) or FOV)	133
☐	L20	L18 and (field with view)	11
☐	L19	L17 and (bolus or contrast or table or gantry or stretcher or bed or support or platform)	16
☐	L18	L16 and (bolus or contrast or table or gantry or stretcher or bed or support or platform)	17
☐	L17	L16 and (move or moving or moved or motion or movement)	19
☐	L16	L15 and ((slab or (volume with slice)) with (thick or thickness or depth))	20
☐	L15	L14 and (read or readout or read-out or frequency or acquir$4 or acquisition or aq)	162
☐	L14	L13 and (excit$5 or encod$5)	162
☐	L13	L12 and (filter$4)	195
☐	L12	L11 and (thick or thickness or depth)	294
☐	L11	L10 and (direction)	421
☐	L10	L9 and ((continuous$3 or constant$4 or "without stopping" or convey$5) with ((imaging or image or imaged) with (volume or region or area or zone or	472

		object or subject or patient)))	
☐	L9	L8 and (FOV or "field of view" or field-of-view or ROI or voi or ((volume or region or area or zone) with (interest or investigation)))	2933
☐	L8	L7 and (track$4 or follow$4 or map$5)	6301
☐	L7	L6 and ((imaging or image or imaged) with (volume or region or area or zone or object or subject or patient))	6855
☐	L6	L5 and (slab or boundary or artifact or venetian or blind or SBA or VB or VBA or (volume with slice))	17479
☐	L5	((magnetic adj resonance) or MRI or NMR)	167467
☐	L4	20020173715	2
☐	L3	20020173715	2
☐	L2	((magnetic adj resonance) or MRI or NMR)	167467
☐	L1	((magnetic adj resonance) or MRI or NMR)	167467

END OF SEARCH HISTORY

05mar04 14:43:56 User259284 Session D2626.2

NPL STIC Search Database
History of Results
3/05/2004

File 155:MEDLINE(R) 1966-2004/Feb W5
(c) format only 2004 The Dialog Corp.
*File 155: Medline has been reloaded. Accession numbers have changed. Please see HELP NEWS 154 for details.

Set	Items	Description
S1	44	MOVING()TABLE
S2	103	(DISPLAC?????? OR MOVE OR MOVES OR MOTIONS OR MOTION OR MO- VING OR MOVED)(2N)TABLE
S3	103	S1:S2
S4	178688	PLATFORM OR CARRIER OR GANTRY OR STRETCHER OR (OBJECT OR P- ATIENT OR EXAMINATION)(2N)(SUPPORT OR STRUCTURE) OR BED OR GU- RNEY
S5	2273	(DISPLAC?????? OR MOVE OR MOVES OR MOTIONS OR MOTION OR MO- VING OR MOVED)(2N)(PLATFORM OR CARRIER OR GANTRY OR STRETCHER OR OBJECT OR PATIENT OR BED OR GURNEY)
S6	22	S1:S5 AND Z(2W)(DIRECTION OR AXIS)
S7	115	(FE OR READ OR READOUT)(5N)(DIRECTION OR AXIS)
S8	759	FREQUENCY(5N)(DIRECTION OR AXIS)
S9	433	ENCOD???????(5N)(DIRECTION OR AXIS)
S10	520	ENCOD???????(5N)FREQUENC?????????
S11	3762	(DISPLAC?????? OR MOVE OR MOVES OR MOTIONS OR MOTION OR MO- VING OR MOVED)(4N)(DIRECTION OR AXIS)
S12	0	S6 AND S7:S10
S13	100	S7:S10 AND S11
S14	6	S1:S5 AND S13
S15	0	S14 AND (FE OR FREQUENCY()ENCOD???????)
S16	1	S14 AND (READ???? OR READOUT()ENCOD???????)
S17	0	S14 AND (READ???? OR READOUT)()ENCOD???????
S18	180568	S3:S5
S19	49	S7:S10 AND S18
S20	6	11AND19
S21	0	S20 NOT S14
S22	6	S14 OR S16 OR S20
S23	111239	'MAGNETIC RESONANCE IMAGING' OR 'FMRI'
S24	8124	R18:R21
S25	117221	S23:S24
S26	22	3AND25
S27	3	S26 AND CONTINUOUS????????
S28	0	S26 AND FE
S29	0	S26 AND FREQUENC???????(2N)ENCOD????????
S30	400	S1:S5 AND FE
S31	13	S1:S5 AND FREQUENC???????(2N)ENCOD????????
S32	2	25AND30
S33	1	25AND31
S34	3	S32:S33
S35	1	S6 AND ENCOD????????
S36	740	S1:S5 AND S23
S37	814	S1:S5 AND S25
S38	4	S37 AND Z
S39	428	(DISPLAC?????? OR MOVE OR MOVES OR MOTIONS OR MOTION OR MO- VING OR MOVED)(2N)(PLATFORM OR CARRIER OR GANTRY OR STRETCHER OR BED OR GURNEY)
S40	11	25AND39
S41	0	S7:S10 AND S40
S42	0	S40 AND FREQUENCY
S43	0	S40 AND ENCOD??????????
S44	1	S40 AND READ????????

? b 73
05mar04 15:04:23 User259284 Session D2626.4

05mar04 15:04:53 User259284 Session D2626.6

SYSTEM:OS - DIALOG OneSearch
File 73:EMBASE 1974-2004/Feb W5
(c) 2004 Elsevier Science B.V.
File 5:Biosis Previews(R) 1969-2004/Feb W5
(c) 2004 BIOSIS

Set	Items	Description
S1	0	MOVING()TABLE()MRI
S2	55	MOVING()TABLE
S3	184	(DISPLAC?????? OR MOVE OR MOVES OR MOTIONS OR MOTION OR MO-VING OR MOVED)(2N)TABLE
S4	1415	(PLATFORM OR CARRIER OR GANTRY OR STRETCHER OR BED OR GURN-EY)(4N)(DISPLAC?????? OR MOVE OR MOVES OR MOTIONS OR MOTION OR MOVING OR MOVED)
S5	272	(DISPLAC?????? OR MOVE OR MOVES OR MOTIONS OR MOTION OR MO-VING OR MOVED)(4N)TABLE
S6	1676	S2:S5
S7	0	FREQUENCY()ENCOD???????? AND S6
S8	70	S6 AND (MRA OR MRI OR FMRI OR MAGNETIC()RESONANCE)
S9	57	RD S8 (unique items)
S10	2	S9 AND ENCOD??????????
S11	1	S9 AND Z
S12	2	S10:S11
S13	3	S9 AND READ?????????
S14	5	S10:S13
S15	5	RD S14 (unique items)

? b 348 349
05mar04 15:10:58 User259284 Session D2626.7

SYSTEM:OS - DIALOG OneSearch
File 348:EUROPEAN PATENTS 1978-2004/Feb W05
(c) 2004 European Patent Office
File 349:PCT FULLTEXT 1979-2002/UB=20040304,UT=20040226
(c) 2004 WIPO/Univentio

Set	Items	Description
S1	563	FREQUENCY()ENCOD??????????
S2	20886	(TABLE OR PLATFORM OR BED OR GURNEY OR STRETCHER)(3N)(DISP-LAC???????? OR MOVE??????? OR MOVING OR MOTION??)
S3	19	1AND2
S4	14135	(TABLE OR PLATFORM OR BED OR GURNEY OR STRETCHER)(5N)(DIRE-CTION OR AXIS)
S5	9	3AND4
S6	75540	IC=G01V? OR IC=G01R? OR IC=A61B?
S7	6	5AND6
S8	639	4AND6
S9	121	S8 AND (MRI OR FMRI OR NMR OR MRA OR MAGNETIC()RESONANCE)
S10	8	1AND9
S11	9	1AND5
S12	11	S10:S11

File 149:TGG Health&Wellness DB(SM) 1976-2004/Feb W4
(c) 2004 The Gale Group

Set	Items	Description
S1	0	MOVING()TABLE()MRI
S2	5	MOVING()TABLE

File 2:INSPEC 1969-2004/Feb W4

Set	Items	Description
S1	16104	R1:R3 OR R6:R8
S2	53	S1 AND FREQUENCY(3N)ENCOD??????????
S3	21	S1 AND READ???????(3N)ENCOD??????????
S4	69	S2:S3
S5	1	S4 AND TABLE
S6	4	S4 AND MOVING
S7	19	S4 AND MOTION
S8	5	S4 AND DISPLAC???????
S9	26	S5:S8
S10	19	S9 AND DIRECTION??

```
     FILE 'INPADOC, WPIX, HCAPLUS' ENTERED AT 14:03:59 ON 05 MAR 2004
                E US20020140423/PN
L1            2 S E3

     FILE 'DPCI' ENTERED AT 14:05:12 ON 05 MAR 2004
L2            0 S DE 10246406/PN
                E US 2001-681420/PRN,AP

     FILE 'INPADOC, WPIX, HCAPLUS' ENTERED AT 14:06:39 ON 05 MAR 2004
                E US20020173715/PN
L3            2 S E3
                E US6385478/PN
L4            2 S E3
L5            4 S L3-4
L6          SEL L5 1- PN :        7 TERMS
L7          SEL L5 1- PRN :        3 TERMS

     FILE 'DPCI' ENTERED AT 14:08:35 ON 05 MAR 2004
L8            2 S L7
L9           15 S L6/PN.G
L10           5 S L6/PN.D
L11          20 S L8-10
L12         SEL L11 1- PN :      66 TERMS
L13         345 S L12/PN.D
L14         352 S L11 OR L13
L15         SEL L14 1- PRN :     475 TERMS

     FILE 'WPIX, JAPIO, HCAPLUS' ENTERED AT 14:11:27 ON 05 MAR 2004
L16         667 S L15
L17       18625 S (Z OR TABLE)(2A)DIRECTION
L18       47520 S TABLE(3A)(MOVE####### OR MOVING OR MOTION OR RAIS##### OR LOW
L19          17 S L16 AND L17
L20           6 S L16 AND L18
L21        1964 S L17 AND L18
L22        1605 S ENCOD#######(2A)(FREQ OR FREQUENC######)
L23           1 S L21 AND L22
L24           0 S L19-20 AND L22
L25        3867 S ENCOD#######(6A)(FREQ OR FREQUENC######)
L26           0 S L19-20 AND L25
L27           1 S L21 AND L25
L28           1 S L19 AND L20
L29           1 S L19-20 AND Z AND TABLE
L30           1 S L19-20 AND Z AND (MOTION OR MOVING OR MOVED)/TI
L31          19 S L16 AND TABLE
L32           4 S L23 OR L27-30

=> s l16 and l25
L33          12 L16 AND L25

=> s l33 not l32
L34          12 L33 NOT L32

=> s l19-20 and l34
L35           0 (L19 OR L20) AND L34

=> s l19-20 and z
L36          16 (L19 OR L20) AND Z

=> s l19-20 and table
L37           7 (L19 OR L20) AND TABLE

=> s l19-20 and platform
L38           0 (L19 OR L20) AND PLATFORM
```

```
=> s l19-20 and examination
L39           7 (L19 OR L20) AND EXAMINATION

=> s l19-20 and patient
L40           8 (L19 OR L20) AND PATIENT

=> s l36 and l37-40
L41           6 L36 AND (L37 OR L38 OR L39 OR L40)

=> s l41 not l32
L42           5 L41 NOT L32
```

L1 ANSWER 2 OF 2 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-057893 [05] WPIX
CR 2003-075077 [07]; 2003-330149 [31]
DNN N2003-044913
TI Magnetic resonance imaging method for medical field, involves moving MR scanner and imaging object in Z-direction till image of field-of-view is reconstructed.
DC S01 S03 S05 T01
IN BRITTAIN, J H
PA (GENE) GE MEDICAL SYSTEMS GLOBAL TECHNOLOGY CO; (BRIT-I) BRITTAIN J H
CYC 3
PI US 2002140423 A1 20021003 (200305)* 22p G01V003-00 <--
DE 10246406 A1 20030528 (200336) G01R033-54
JP 2003135429 A 20030513 (200340) 22p A61B005-055
ADT US 2002140423 A1 CIP of US 2001-681420 20010330, US 2001-682699 20011005; DE 10246406 A1 DE 2002-10246406 20021004; JP 2003135429 A JP 2002-292200 20021004
PRAI US 2001-682699 20011005; US 2001-681420 20010330
IC ICM A61B005-055; G01R033-54; G01V003-00
ICS G01R033-30
AB US2002140423 A UPAB: 20030624
NOVELTY - The slab thickness is selected to be smaller than desired field-of-view (FOV) and within optimal imaging volume of a magnetic resonance (MR) scanner. The scanner and an object are continuously moved in the Z-direction, while spins are repeatedly excited and encoded. Data restricted to the selected slab thickness is acquired till an image of FOV is reconstructed.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:
(1) MRI apparatus;
(2) Medical image scanner control program.
USE - Used in medical field.
ADVANTAGE - Allows for reconstructing images without discontinuities, and eliminates slab-boundary artifacts and hence reduces scan time, by continuously moving the imaging object with respect to the MR scanner.
DESCRIPTION OF DRAWING(S) - The figures show the flowcharts illustrating data acquisition and data processing steps.
4, 5, 9/11
FS EPI
FA AB; GI
MC EPI: S01-E02A2A; S01-E02A8C; S03-E07A; S05-D02B; T01-J06A; T01-J10B1; T01-S03

Applicants own Application Not Prior Art TAF 3/05/2004

read encd frequency readout FE

April 9 2001

FOV

Gz

~~Z~~ axis

table moves in Z direction

12/TI,PN,PD,AN,AD,IC,AB,AB,K/5 (Item 5 from file: 348)

Respiratory gating method for MR imaging
Verfahren der atmungsabhangigen Triggerung fur die Magnetresonanzbildgebung
Procede de declenchement sensible a la respiration pour l'imagerie par resonance magnetique
PATENT (CC, No, Kind, Date): EP 994363 A2 000419 (Basic)
EP 994363 A3 020313
APPLICATION (CC, No, Date): EP 99308026 991012;
PRIORITY (CC, No, Date): US 173194 981015
INTERNATIONAL PATENT CLASS: **G01R-033/567**

ABSTRACT EP 994363 A2
NMR data required to reconstruct an image is divided into central k-space views (313) and peripheral k-space views (315). ***NMR*** navigator signals are acquired during a scan to indicate patient respiration and a first gating signal is produced when respiration is within a narrow acquisition window (322) and a second gating signal is produced when respiration is within a wider acquisition window (324). Central k-space views (313) are acquired when the first gating signal is produced and peripheral k-space views (315) are acquired when the second gating signal is produced.
INTERNATIONAL PATENT CLASS: **G01R-033/567**

...ABSTRACT A2
NMR data required to reconstruct an image is divided into central k-space views (313) and peripheral k-space views (315). ***NMR*** navigator signals are acquired during a scan to indicate patient respiration and a first gating signal is produced when respiration is within a narrow acquisition...

SPECIFICATION The field of the invention is nuclear **magnetic** ***resonance*** imaging methods and systems. More particularly, the invention relates to the gating of **NMR** image data acquisition as a function of patient respiration.
When a substance such as human tissue is subjected to a uniform magnetic field (polarizing field...

...scanned by a sequence of measurement cycles in which these gradients vary according to the particular localization method being used. The resulting set of received **NMR** signals are digitized and processed to reconstruct the image using one of many well known reconstruction techniques.
The present invention will be described in detail...

...Fourier transform (FT) imaging technique, which is frequently referred to as "spin-warp". The spin-warp technique is discussed in an article entitled "Spin-Warp **NMR** Imaging and Applications to Human Whole-Body Imaging" by W.A. Edelstein et al., Physics in Medicine and Biology, Vol. 25, pp. 751-756 (1980). It employs a variable amplitude phase encoding magnetic field gradient pulse prior to the acquisition of **NMR** signals to phase encode spatial information in the direction of this gradient. In a two-dimensional implementation (2DFT), for example, spatial information is encoded in...

...phase encoding gradient pulse Gy)) is incremented ((square)Gy))) in the sequence of "views" that are acquired during the scan to produce a set of ***NMR*** data from which an entire image can be reconstructed.
Most **NMR** scans currently used to produce high resolution 3D medical images, such as the image of coronary arteries, require many minutes to acquire the necessary data...

...gating methods employ a means for sensing patient respiration (e.g. U.S. Pat. No. 4,994,473) and producing a gating signal for the ***MRI*** system during a preset potion of the respiratory cycle. As long as the gating signal is produced, the **MRI** system acquires **NMR** data in the prescribed view order. During other parts of the respiratory cycle the gating signal is turned off and no data is acquired. As...

...increased significantly because data can only be acquired over a relatively short portion of each respiratory cycle.

The present invention is a method for acquiring **NMR** data using respiratory gating that enables acquisition of data over a larger portion of each respiratory cycle without significantly reducing image quality. More particularly, the...

...gating signal is produced when respiration is within a narrow window, a second gating signal is produced when respiration is within a wide window, the **MRI** system is enabled to acquire **NMR** data from the central region of k-space when the first gating signal is produced, the **MRI** system is enabled to acquire **NMR** data from the peripheral region of k-space when the second gating signal is produced, and no ***NMR*** data is acquired when neither gating signal is produced.

The invention enables the scan time to be shortened when using respiratory gating without significantly reducing which:

Fig. 1 is a block diagram of an ***MRI*** system which employs the present invention;

Fig. 2 is an exemplary 3D ***NMR*** pulse sequence which may be used when practicing the present invention;

Fig. 3 is a graphic representation of (ky)), kz)))-space showing its central and...

...windows according to the present invention; and

Fig. 6 is a flow chart which illustrates the preferred method of practicing the present invention with the ***MRI*** system of Fig. 1.

Referring first to Fig. 1, there is shown the major components of a preferred ***MRI*** system which incorporates the present invention. The operation of the system is controlled from an operator console 100 which includes a keyboard and control panel...

...the patient may be sensed by the same RF coil 152 and coupled through the transmit/receive switch 154 to a preamplifier 153. The amplified **NMR** signals are demodulated, filtered, and digitized in the receiver section of the transceiver 150. The transmit/receive switch 154 is controlled by a signal from...

...also enables a separate RF coil (for example, a head coil or surface coil) to be used in either the transmit or receive mode.

The **NMR** signals picked up by the RF coil 152 are digitized by the transceiver module 150 and transferred to a memory module 160 in the system control 122. When the scan is completed and an entire array of k-space **NMR** data has been acquired in the memory module 160, an array processor 161 operates to Fourier transform the data into an array of image data...

...For a more detailed description of the transceiver 150, reference is made to U.S. patent Nos. 4,952,877 and 4,992,736.

The ***MRI*** system of Fig. 1 performs a series of pulse sequences to collect sufficient ***NMR*** data to reconstruct the desired image. Referring particularly to Fig. 2, an exemplary 3D gradient recalled echo pulse sequence employs a selective RF excitation pulse 300 which is applied to the subject in the presence of a Gz)) slice select gradient pulse 301. To compensate the ***NMR*** signal 303 which has the maximum intensity located at a time TE after the excitation pulse 300 for the phase shifts caused by the slice select gradient pulse 301 and to desensitize the **NMR** signal 303 to velocity along the z-axis, a

negative Gz)) gradient pulse 304 followed by a positive Gz)) gradient pulse 305 are produced by...

...gradient waveforms are also well known to those skilled in the art for compensating acceleration and even higher orders of motion.
To position encode the **NMR** signal 303 a phase encoding Gy)) gradient pulse 306 is applied to the subject shortly after the application of the RF excitation pulse 300. As...

...phase encoding pulse is stepped through a series of, for example, 256 discrete phase encoding values to localize the position of the spins producing the ***NMR*** signal along the y-axis. Position along the x-axis is located by a Gx)) gradient pulse 307 which is produced as the **NMR** gradient echo signal 303 is acquired and which **frequency** ***encodes*** the ***NMR*** signal 303. Unlike the Gy)) phase encoding gradient pulse 306, the Gx)) readout gradient pulse 307 remains at a constant value during the entire scan...

...along the x direction, gradient pulses 308 and 309 precede the gradient pulse 307 as taught in U.S. Pat. No. 4,731,583.
The **NMR** signal 303 is acquired by the system transceiver 122 and digitized into a row of Nx)) (e.g. 256) complex numbers which are stored in memory. For each combination of the (Gy)), Gz))) phase encoding gradients an **NMR** signal 303 is produced, acquired, digitized and stored in a separate row of Nx)) (e.g. 256) complex numbers. At the completion of the scan...

...at 314 and 316. In one, embodiment of the invention indicated in Fig. 3, this k-space is sampled line-by-line in the ky ***direction*** . A look-up **table** (not shown) is created for ky)) phase encodings for the entire scan. This look-up table starts from the center of ky))-space and works...

...and working upward from its end until all the views are acquired.
It should be apparent to those skilled in the art that many other **NMR** pulse sequences may be used and that the invention can be applied to both 2DFT and 3DFT acquisitions. With 3DFT acquisitions the sampling of k...

...k-space and the outer part of the spiral k-space sampling designated the peripheral region of k-space.
The acquisition of the k-space **NMR** data array is performed under the control of respiratory gating signals. Patient respiration may be monitored in a number of ways, such as with a bellows, but in the preferred embodiment it is monitored using **NMR** navigator signals acquired periodically throughout the scan. As described in U.S. patent No. 5,363,844 issued on November 15, 1994 and entitled "Breath-Hold Monitor for MR Imaging", the degree of chest inflation is monitored with **NMR** measurements of the superior-inferior (S/I) position of the patient's diaphragm. The ***NMR*** measurements are a series of navigator pulse sequences in which a column of spins located at the right side of the abdomen, and transecting the diaphragm near the dome of the liver is excited by a two-dimensional rf pulse. A subsequent ***NMR*** signal is ...a readout gradient (Gz)) in the preferred embodiment) directed along the lengthwise dimension of the excited column and Necho)) (e.g. 256) samples of the **NMR** navigator signal are Fourier transformed by the array processor 161. The two-dimensional excitation rf pulse is, for example, a 30 mm diameter Gaussian excitation...

...preferred embodiment) and the receiver low pass filter is set for a field of view (e.g. 260mm) along the excited column (z axis). The **NMR** signal is sampled at Necho)) points during a period of, for example, 4 msec. sample period. The diaphragm position in the excited column appears as an inflection in the acquired and Fourier transformed ***NMR*** navigator signal. The position of this inflection is determined

by using an edge detection (derivative filter) technique which includes a 20-sample wide averaging filter...

...when the position of the diaphragm is within the band of positions to either side of this narrow range. The first gating signal enables the **MRI** scanner to acquire k-space data from the central region 312 of k-space, and the second gating signal enables the **MRI** scanner to acquire k-space data from the peripheral regions 314 and 316.
Referring particularly to Fig. 6, when a scan is performed using the...

...are maintained. The first is a central view index which is preset to the start, or top, of the table 354 and is incremented to **move** down the ***table*** 354 during the scan. The second index is a peripheral view index which is preset to the end, or bottom, of the table 354 and is decremented to ***move*** up the ***table*** 354 during the scan.
Referring still to Fig. 6, the ***MRI*** system then performs the scan to acquire image data. A loop is entered and the first step as indicated at process block 360 is to...signal acquired in process block 362. Other pulse sequences can be employed to acquire image data, and the number of views, or the number of **NMR** signals acquired during each pass through process blocks 364 and 368 can be varied.

CLAIMS 1. A method for acquiring ***NMR*** image data from a subject during a scan with an **MRI** system, the steps comprising:
a) monitoring the respiration (360) of the subject;
b) producing a first gating signal (362) when subject respiration is within a preselected narrow acquisition window (322);
c) producing a second gating signal (366) when subject respiration is within a preselected wide acquisition window (324);
d) acquiring **NMR** image data from a central region of k-space (364) when the first gating signal is produced;
e) acquiring **NMR** image data from a peripheral region of k-space (368) when the second gating signal is provided; and
f) repeating steps a) through e) until sufficient **NMR** image data is acquired from the central and peripheral regions of k-space to reconstruct an image (374).
2. The method as recited in claim 1 in which step a) is performed using the **MRI** system to acquire navigator **NMR** data from which the position of the subject's diaphragm can be measured.
3. The method as recited in claim 1 which includes:
producing a view order table (354) which indicates the order in which **NMR** image data is to be acquired from k-space, and
in which step d) includes reading from one end of the view order table (354) an indication of the next **NMR** image data to be acquired from k-space and step e) includes reading from the other end of the view order table (354) an indication of the next **NMR** image data to be acquired from k-space.
4. The method as recited in claim 3 in which step f) is completed when all **NMR** image data indicated in the view order table (354) has been acquired.
5. The method as recited in claim 1 in which steps d) and...

...5 which includes:

producing a view order table (354) which indicates the magnitudes of phase encoding gradient pulses used in the pulse sequence during each ***NMR*** image data acquisition (364, 368).
7. The method as recited in claim 6 in which the view order table (354) stores values which indicate a...

...claim 8 in which step f) is completed when all the values in the view order table (354) have been read and used to acquire **NMR** image data in steps d) or e).
10. The method as recited in claim 2 in which the first gating signal is produced when the...

12/TI,PN,PD,AN,AD,IC,AB,AB,K/6 (Item 6 from file: 348)

Apparatus for and method of imaging
Abbildungsgerat und Verfahren
Appareil et methode d'imagerie
PATENT (CC, No, Kind, Date): EP 919186 A2 990602 (Basic)
EP 919186 A3 000405
APPLICATION (CC, No, Date): EP 98309226 981111;
PRIORITY (CC, No, Date): US 979571 971126
INTERNATIONAL PATENT CLASS: **A61B-006/03; A61B-006/00**

ABSTRACT EP 919186 A2
A frame (A) of an imaging device such as a CT scanner or an **MRI** device has a bore defining a patient examination region (12). A first x-ray source (B) is mounted to a frame (C) for rotation around the examination region (12). An arc of first radiation detectors (14) detects x-rays which have traversed the examination region. A first image reconstruction processor (18) reconstructs a tomographic image representation from signals generated by the first radiation detectors. A fluoroscopy device (D) is mechanically coupled to the diagnostic scanner for generating and displaying at least substantially real-time fluoroscopic projection image representations on a display monitor (78). A second x-ray source (32) transmits x-rays to an amorphous silicon flat panel radiation detector (36). A second image reconstruction processor reconstructs the fluoroscopic projection image representations from signals generated by the flat panel radiation detector (36). A C-arm (30) supports the second x-ray source (32) and the flat panel radiation detector (36) in a plane offset from a plane of the C-arm. A movable mounting structure (E) is mechanically connected with the gantry (A) and the C-arm (30) to move the C-arm between a stored position and an operating position adjacent the bore.

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A frame (A) of an imaging device such as a CT scanner or an **MRI** device has a bore defining a patient examination region (12). A first x-ray source (B) is mounted to a frame (C) for rotation around...

...SPECIFICATION imaging, especially for medical diagnosis. It finds particular application in conjunction with a diagnostic imaging device such as a computerized tomographic (CT) scanner and a **Magnetic Resonance** Imaging (**MRI**) apparatus, which includes a fluoro-assist device, and will be described with particular reference thereto. However, it should be appreciated that the present invention may ...

...to the accompanying drawings, in which:
Figure 1 is a perspective view of an exemplary diagnostic imaging device such as a CT scanner or a **Magnetic Resonance** Imaging (**MRI**) apparatus having an integrated fluoro-assist device with a C-arm shown in an operating position;
Figure 2 is a perspective view of the CT...Figure 20 is a perspective view of an eighth embodiment of a fluoro-assist device; and
Figure 21 is a side elevation view of the **Magnetic Resonance** Imaging (**MRI**) apparatus of Figure 1 with the C-arm shown in the operating position.
With reference to Figures 1 and 2, an exemplary diagnostic imaging system...
...12 along the beam 26. It should be appreciated that at least the patient

couch can be configured to pan laterally relative to a longitudinal ***axis*** of the gantry bore. The ***table*** 24, beam 26, and couch 28, cooperate to define a patient support which is adapted for movement through the examination region.

An integrated fluoroscopy or...mounted to a mobile cart 180. In addition, with reference to Figure 21, the fluoroscopy or fluoro-assist device D can be mounted to an ***MRI*** device 200. The ***MRI*** device includes a frame 202 housing a main magnet 204 for generating a temporally constant main magnetic field through an examination region 206. A series...

...generate current pulses which result in corresponding gradient magnetic field pulses along the x-, y-, and z-axis for phase encoding, and read oil or ***frequency*** ***encoding*** . A radio frequency coil 210 and a radio frequency transmitter (not shown) generate RF excitation pulses for exciting **magnetic resonance** and inversion or other pulses for manipulating the ***magnetic*** ***resonance*** .

The patient table 24 is positioned adjacent the **MRI** device so as to extend from the examination region 206 in a first direction substantially along a central axis of a bore defining the examination...

...CLAIMS end thereof.

10. Imaging apparatus as claimed in any one of claims 1 to 9, wherein the first imaging subsystem is a CT scanner or ***MRI*** apparatus.
11. A method of generating fluoroscopic projection image representations using the imaging apparatus of any one of claims 1 to 10, including: moving the...

read readout
frequency encod
FE

L32 ANSWER 1 OF 4 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1998-087106 [08] WPIX
DNN N1998-069117
TI Magnetic resonance imaging apparatus for imaging patient examination zone - has patient support device for displacement of **table** top, magnet for generating uniform, steady magnetic field having parallel lines of force.
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ICS G01R033-3415; G01R033-385; G01R033-3875
AB WO 9800726 A UPAB: 19980223
The apparatus includes magnet (1) for generating in examination zone (3) uniform, steady magnetic field having parallel lines of force extending in a first **direction** (**Z**), gradient coil (5)for generating magnetic gradient field, and an RF coil system for generating RF pulses and for receiving MR signals. A device for generating data from MR signals and a reconstruction unit for reconstructing MR image of the examination zone are also included.

A patient support **table** top (7) has drive device (11) for displacement of the **table** top in the first **direction** (**Z**). The drive is coupled to a control unit. the magnet has toroidal-shaped casing surrounding the bore and a longitudinal axis extending parallel to the first direction. Magnetic field generated by the magnet is homogeneous in a disc-shaped homogeneity volume having longitudinal axis coinciding with the longitudinal axis of the magnet, and has a diameter that is at least twice its longitudinal thickness which is not more than 10 cm.

ADVANTAGE - Useful for examining longitudinal extending parts, such as aorta, e.g. for complete angiographic study of patient aorta. Image of examination zone can be reconstructed from auxiliary data set.
Dwg.1/6
FS EPI
FA AB; GI
MC EPI: S01-E02A2; S01-E02A8A; S01-E02A8E; S03-E07A; S05-D02B1; V02-F01G